NON-PUBLIC?: N
ACCESSION #: 9005070060
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Peach Bottom Atomic Power Station - PAGE: 1 OF 03
Unit 3

DOCKET NUMBER: 05000278

TITLE: Various Engineered Safety Feature System Actuations Due to
Reactor Vessel Level Fluctuations After Manual Scram
EVENT DATE: 01/28/90 LER #: 90-002-01 REPORT DATE: 04/30/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: A. A. Fluvio, Regulatory Engineer TELEPHONE: (717) 456-7014

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On January 28, 1990 the Unit 3 reactor was manually scrammed due to a leak of Electrohydraulic Control System (EHC) fluid at the number one main turbine control valve. Reactor coolant level fluctuations following the scram resulted in three Group II and III Primary Containment Isolation System (PCIS) actuations. The cause of the EHC fluid leak was failure of an O-ring on the fluid inlet port to the servo valve which controls the number one main turbine control valve. The reactor level fluctuations were aggravated by the need for rapid depressurization via the main turbine bypass valves, inability to restart the 'C' reactor feedwater pump (RFP) and the subsequent batch feeding of reactor coolant via the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems. Inability to reset the 'C' RFP was due to a RFP turbine hydraulic control problem. The cause of this problem was the lock nut on the RFP interlock dump valve setting adjustment bolt becoming

unsecured due to system vibration. No actual safety consequences occurred as a result of this event. The EHC fluid leak was stopped and the leaking servo valve was replaced. Investigation into the servo valve O-ring failure could not determine a plausible root cause. This failure is considered an isolated occurrence and not systematically recurring in nature. The RFP interlock dump valve lock nuts on both units will be mechanically secured. No previous similar LERs were identified.

END OF ABSTRACT

Requirements for the Report

This report is required pursuant to 10 CFR 50.73(a)(2)(iv) due to automatic and manual actuation of various Engineered Safety Feature systems.

Unit Status at Time of Event

Unit 3 was in the Run Mode at 100 percent power.

Description of the Event

On January 28, 1990 at 0854 hours the Unit 3 reactor power was lowered to 50 percent and manually scrammed due to a leak of Electrohydraulic Control System (EHC) fluid at the number one main turbine control valve. Reactor water level then decreased to the minus eight inch level resulting in an anticipated Group II and III Primary Containment Isolation System (PCIS) actuation. The main turbine was manually tripped. Reactor level quickly recovered and at 0858 hours reached the plus forty five inch level resulting in automatic trip of the 'C' reactor feedwater pump (RFP). The PCIS actuation was reset. At 0900 hours the turbine bypass valves were manually opened approximately 25 percent to provide depressurization of the reactor. The 'C' RFP could not be restarted so the Reactor Core Isolation Cooling System (RCIC) was manually started to control reactor level. However by this time, 0909 hours, reactor level dropped to the minus three inch level resulting in a second Group II and III PCIS actuation. The High Pressure Coolant Injection System (HPCI) was then utilized intermittently to assist in controlling reactor level. The PCIS actuation was again reset. At 0933 hours reactor level decreased to the minus 2 inch level resulting in a third Group II and III PCIS actuation. By 0936 hours the Main Steam Isolation Valves were manually closed, reactor level had recovered, HPCI and the EHC pump were secured.

Cause of the Event

The EHC fluid leak was caused by failure of an O-ring on the fluid inlet port to the servo valve for hydraulically operated valve HO-5275A which controls the number one main turbine control valve. Investigation into the servo valve O-ring failure could not determine a plausible root cause. This failure is considered an isolated occurrence and not systematically recurring in nature.

The initial Group II and III PCIS actuation was anticipated on low reactor level as a result of the manual scram. The second PCIS actuation occurred on low reactor level due to the failure of the 'C' RFP to restart. This was caused by drift of the setting of the interlock dump valve which did not allow sufficient oil pressure to be maintained to open the RFP turbine control valve. The root cause of the setting drift of the interlock dump valve is attributed to the lock nut on the setpoint adjustment bolt becoming unsecured due to system vibration.

The third low level PCIS actuation was due to the rapid level fluctuations created by the combination of attempting rapid depressurization via the turbine bypass valves while batch feeding reactor coolant inventory with HPCI. Rapid depressurization was necessary due to the potential for the turbine bypass valves to fail closed on loss of EHC fluid.

Analysis of the Event

No actual safety consequences occurred as a result of this event.

A Group II and III PCIS actuation signal occurs when reactor coolant reaches the zero inch level (172 inches above the top of active fuel). The initial low level PCIS actuation immediately following the scram is not unexpected and is the result of void collapse upon insertion of the control rods. During this event reactor level fluctuated within a range of plus fifty five inches to minus 8 inches. A minus 8 inch level corresponds to 164 inches of reactor coolant above the top of active fuel. Closure of the main turbine bypass valves due to loss of EHC fluid would have been bounded by the Final Safety Analysis Report abnormal transient analyses for a turbine trip without bypass or isolation of all main steam lines. Therefore, the fuel was not in danger of becoming uncovered at any time during this ev
nt.

Corrective Actions

The EHC fluid leak was stopped and the leaking EHC servo valve was replaced. A walkdown of the EHC fluid piping was performed and no other leaks were identified.

The A, B and C RFP interlock dump valves lock nuts were inspected in Unit 2 and 3. The Unit 3 'B' RFP interlock dump valve lock nut was also found to be unsecured. The Unit 3 RFP interlock dump valves were readjusted and tested to verify proper setting. The Unit 2 RFP interlock dump valve lock nuts were found to be properly secured. The RFP interlock dump valve lock nuts on both units will be mechanically secured to prevent inadvertent movement of the adjustment bolt.

Previous Similar Events

No previous similar Licensee Event Reports have been identified.

ATTACHMENT 1 TO 9005070060 PAGE 1 OF 1

CCN-90-14082

PHILADELPHIA ELECTRIC COMPANY
PEACH BOTTOM ATOMIC POWER STATION
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PEACH BOTTOM-THE POWER OF EXCELLENCE

April 30, 1990
Docket No. 50-278

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Licensee Event Report
Peach Bottom Atomic Power Station - Unit 3

This LER concerns Engineered Safeguards Feature (ESF) actuations due to reactor vessel level fluctuations following a manual scram. This LER has been revised to provide the results of a failure analysis of a servo valve O-ring.

Reference: Docket No. 50-278
Report Number: 3-90-002

Revision Number: 01
Event Date: 01/28/90
Report Date: 04/30/90
Facility: Peach Bottom Atomic Power Station
RD 1, Box 208, Delta, PA 17314

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(v).

Sincerely,

Plant Manager

cc: J. J. Lyash, USNRC Senior Resident Inspector
T. T. Martin, USNRC, Region I

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